Claims

1.   A system for performing operations management in an environment of a plurality of resources comprising:

a plurality of devices corresponding to the plurality of resources, each of said devices performing the steps of:

characterizing said corresponding resource; and

determining at least one relation between said corresponding resource and others of said plurality of resources.

2.   A system for performing operations management as in claim 1 wherein said each device performs the further steps of:

selecting at least one of said resources having said at least one relation; and

transforming said selected resources to form at least one new resource in the environment.

3.   A system for performing operations management as in claim 2 wherein said characterizing said corresponding resource step comprises the step of representing characteristics with a plurality of properties and/or processes.

4.   A system for performing operations management as in claim 3 wherein said selecting at least one of said resources step comprises the steps of:

identifying matching ones of said properties and/or processes to form a plurality of matching groups;

evaluating said matching groups by computing how well said attributes match; and

selecting at least one of said matching groups that are optimal with respect to said evaluation.

5.   A system for performing operations management as in claim 3 wherein said properties are selected from the group consisting of isa, hasa, doesa, and needsa.

6.   A system for performing operations management as in claim 2 wherein said devices perform the further step of:

determining a graph representation of said resources and said relations.

7.   A system for performing operations management as in claim 1 wherein said determining at least one relation step comprises the step of:

searching for complementary ones of said resources.

8.   A system for performing operations management as in claim 7 wherein said determining at least one relation step comprises the step of:

searching for resources having complementary ones of said properties and/or processes.

9.   A system for performing operations management as in claim 1 wherein said determining at least one relation step comprises the step of:

searching for substitute ones of said resources.

10.   A system for performing operations management as in claim 9 wherein said determining at least one relation step comprises the step of:

searching for resources having substitute ones of
5   said properties and/or processes.

11.   A system for performing operations management as in claim 1 wherein each of said plurality of devices is physically attached to said corresponding resource.
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12.   A system for performing operations management as in claim 1 wherein each of said devices comprise data to identify said corresponding resource.

15   13.   A system for performing operations management as in claim 12 wherein said data is a bar code.

14.   A system for performing operations management in an environment of a plurality of resources comprising:
20   a plurality of devices corresponding to the resources, each of said devices performing the step of:

characterizing said corresponding resources;
and

selectively transforming said corresponding
25   resource.

15.   A system for performing operations management as in claim 14 wherein said selectively transforming said corresponding resource comprises the steps of:

determining a plurality of candidate
30   transformations of said corresponding resource; and

evaluating at least one expected consequence of performing said at least one candidate transformation on a subset, P, of the plurality of resources.

5   16. A system for performing operations management as in claim 15 wherein said selectively transforming step further comprises the step of:
    performing said selected candidate transformation.

10   17. A system for performing operations management as in claim 15 wherein said subset, P, of the plurality of resources is a proper subset.

    18. A system for performing operations management
15   as in claim 14 wherein said selectively transforming step is performed by only a portion, tau, of said devices.

    19. A system for performing operations management as in claim 14 wherein said selectively transforming said
20   corresponding resource step comprises the step of:
    determining a plurality of candidate transformations of said corresponding resource;
    assigning said corresponding resource to at least one patch of said resources;
25   evaluating a utility of said patch of resources of performing said candidate transformations; and
    selecting at least one of said candidate transformations that is optimal with respect to said utility.

30   20. A system for performing operations management as in claim 19 wherein said patch is a proper subset of the plurality of resources.

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21. A system for performing operations management as in claim 19 wherein said at least one patch is at least one disjoint subset of the plurality of resources.

22. A system for performing operations management in an environment of entities and resources comprising:

a plurality of devices corresponding to the plurality of resources, each of said devices performing the steps of:

representing said corresponding resource with data; and

transmitting said characterizing of said corresponding resource to others of said plurality of devices; and

at least one computer, said computer performing the steps of:

receiving said data for said at least one devices; and

determining at least one relation among the resources for said data.

23. A system for performing operations management as in claim 22 further comprising a communication network communicating said data among said at least one computer and said at least one integrated circuit.

24. A method for performing operations management in an environment of a plurality of resources comprising the steps of:

defining at least one algorithm having one or more parameters for performing operations management;

defining at least one global performance measure of said at least one algorithm;

executing said algorithm for a plurality of different values of said one or more parameters to generate a corresponding plurality of values for said global performance measure;

constructing a fitness landscape from said values of said parameters and said corresponding values of said global performance measure; and

optimizing over said fitness landscape to generate optimal values for said at least one parameter.

25. A method for performing operations management as in claim 24 wherein said defining an algorithm step comprises the steps of:

representing the plurality of resources with a corresponding plurality of devices wherein each of said devices performs the steps of:

characterizing said corresponding resource; and

selectively transforming said corresponding resource.

26. A method for performing operations management as in claim 25 wherein said at least one parameter comprises a proportion, p of the plurality of resources.

27. A method for performing operations management as in claim 26 wherein said selectively transforming said corresponding resource step comprises the steps of:

determining a plurality of candidate transformation of said corresponding resource; and

evaluating at least one expected consequence of performing said at least one candidate transformation on

5 said proportion, *p* of the plurality of resources.

28. A method for performing operations management as in claim 27 wherein said selectively transforming step further comprises the step of:

10 performing said selected candidate transformation.

29. A method for performing operations management as in claim 25 wherein said at least one parameter comprises

15 a fraction, *tau*, of said plurality of devices.

30. A method for performing operations management as in claim 29 wherein said selectively transforming step is performed on only said fraction, *tau*, of said plurality of

20 devices.

31. A method for performing operations management as in claim 25 wherein said at least one parameter comprises a size of one or more patches of said plurality of devices

25 and a location of said patches.

32. A method for performing operations management as in claim 31 wherein said selectively transforming said corresponding resource step comprises the step of:

30 determining a plurality of candidate transformations of said corresponding resource;

assigning said corresponding resource to at least one of said patches of said resources;

evaluating a utility of said patch of resources of performing said candidate transformations; and

5   selecting at least one of said candidate transformations that is optimal with respect to said utility.

33.   A device for performing operations management in an environment of a plurality of resources, said device

10 representing one of the resources and comprising at least one memory storing computer executable program codes, wherein the program code comprises:

code to characterize said corresponding resource; and

15   code to determine at least one relation between said corresponding resource and others of said plurality of resources.

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